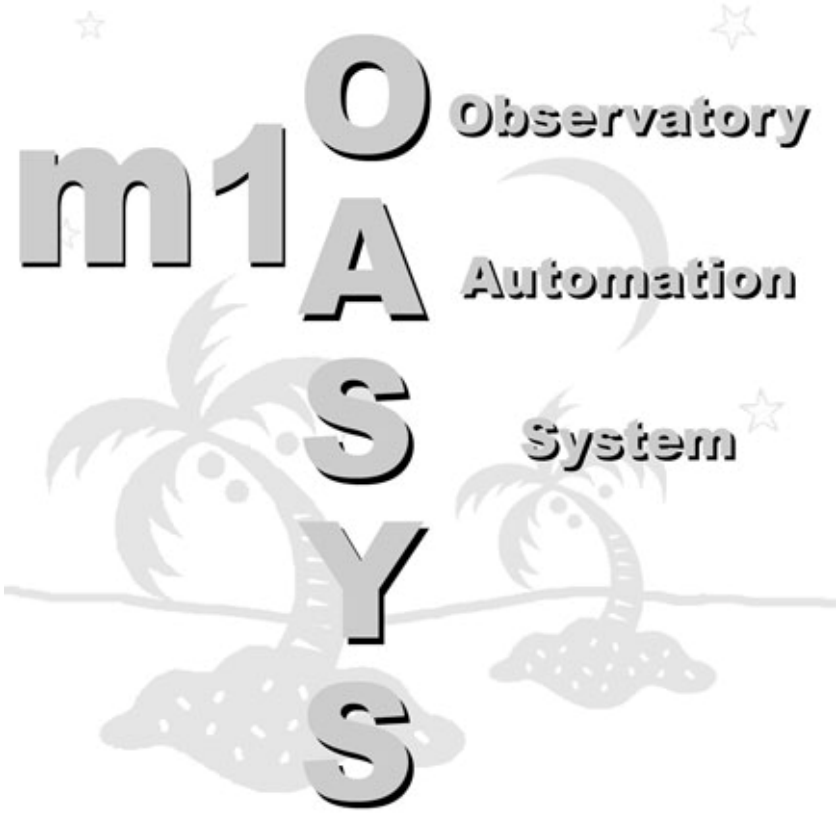


Installation and Setup Instructions

m1OASYS
Observatory Automation System

Thank you for purchasing the m1OASYS System. This very flexible and robust system is a must-have tool for anyone wishing to secure, monitor, and remotely control their telescope observatory.

The core functions of the system are to;

1) **Secure** your Observatory - World-class home security system includes up to 16 separate zones to monitor windows, doors and other areas for intrusion, fire, etc....The system can alert owner of security alerts via Phone, Text Message or Email. The system can also be connected to a remote monitoring company for added security. The security features of this system are additionally utilized as an add-on safety step when opening or closing the roof.

Warning: Opening or Closing a roll-off roof is not a trivial task and the operator needs to take all necessary precautions before starting the roof motor. Damage to equipment or persons can occur when the roof is in motion so all necessary precautions should be taken before executing such a command.

2) **Monitor** your Observatory - Monitors security status, arming/disarming events, intrusions, temperature limits, AC power failures, and more. System can alert owner of these events or failures via Phone, Text Messaging, or Email. In addition the system can be programmed by the end-user to react to specific events, for example when an AC power failure is detected, and the roof is open, the system can contact you via phone so that you can then park your telescope, power down your camera, secure your observatory and close the roof. The possibilities are truly amazing.

3) **Control** your Observatory - The m1 OASYS can be programmed to automate many of the key functions of your observatory. The system can automate the open and close functions of your observatory roof and can be integrated into the security functions to optionally ensure that your telescope is in a secure and parked position before opening or closing the roof. The system can control lighting and turn on/off individual systems such as computers, cameras, or mounts. All these automation tasks can be executed locally, via a system keypad or computer, or remotely via Phone or Java Internet application. An ASCOM compliant PC application is also included so many of these tasks can be executed by programs such as CCDAutopilot, CCDCommander, or ACP.

Important: Read this document and all supporting product documentation and warranties in their entirety before installing or operating your m1OASYS. Every effort has been made to include guided directions and information however it is the installers and operators responsibility to ensure the system installed and implemented in a fashion that suites the users environment and meets the specification of the product.

M1OASYS makes no warranty as to the operation or automation of the observatory equipment; it simply provides components for 'Do It Yourself' automation projects.

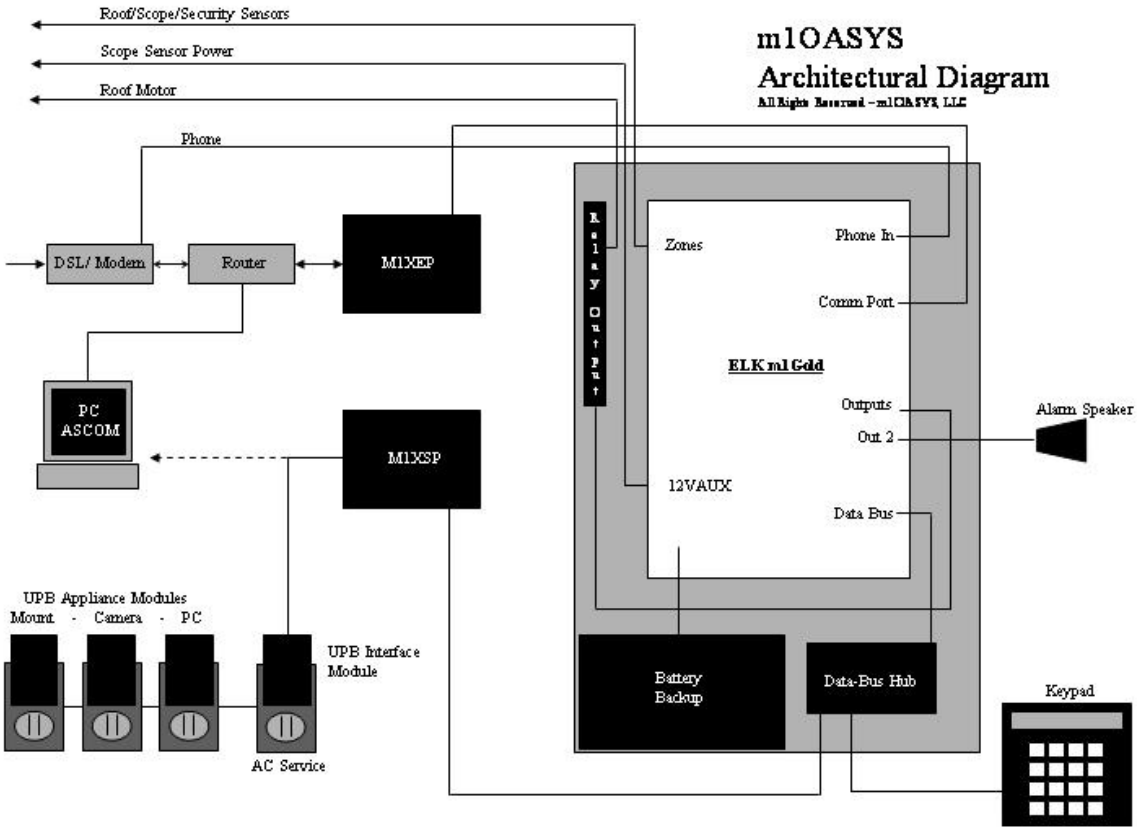
- Install unit close to an electrical outlet and place power cords where people will not trip over them
- Install equipment on a stable surface
- Ensure power to unit is appropriate and install a surge protector to guard against power surges
- Keep liquids away from equipment
- Install equipment in a location that does not get direct sunlight
- Do not install this unit in an environment where it might be exposed to moisture or extreme temperatures. See equipment installation manuals for appropriate operating temperatures.
- Use original packaging if you need to return the unit for repairs

Caution! Automation of any rolling roof observatory requires special attention with regard to the location of individuals in the observatory, as well as the position of the telescope/mount, prior to moving the roof to ensure no one or nothing obstructs the roofs path. Serious injury to individuals and/or damage to telescope, mount or the observatory may occur if this advice is not followed. We recommend that all users of m1OASYS implement safety policies and procedures regarding the operation of their rolling roof. In addition we strongly recommend installation of safety sensors that will prevent or stop movement of the roof should individuals or equipment move into an unsafe position before or during roof movement. For remote/automated operation of rolling roofs it is recommended that the "Do Not Auto-Close' checkbox in the m1Live software be checked if the roof does not safely clear the scopes/mounts. Misuse or careless operation can cause serious damage to your equipment or individuals. The author of the software and the distributor of the equipment (1) make no warranty or representation to the user as to the operation of this System and (2) is NOT responsible for any injury or damage that may occur from careless implementation, operation or misuse.

Installation and Setup:

Pre-wire Recommendation. Your wiring may differ based on your implementation. This is an example configuration for the m1OASYS Max. Cat 5 cabling may be used for all sensors and accessories if desired.

- 1 wire from ELK m1 to LBB Motor Interface
- 1 Cat 5 wire (wired as Ethernet 568A) from ELK m1 to keypad (see Data Bus Hub wiring diagram)
- 1 Cat 5 wire (wired as Ethernet 568A) from ELK m1 to serial port expander for lighting controls, place adapter near your computer (see Data Bus Hub wiring diagram)
- 1 Cat 5 wire (wired as Ethernet 568A) from ELK m1 to serial port expander for serial interface control (see Data Bus Hub wiring diagram)
- 1 wire from ELK m1 to interior speaker
- 1 wire from ELK m1 to alarm speaker
- 1 wire each from ELK m1 to each door
- 1 wire each from ELK m1 to each window
- 1 wire from ELK m1 to smoke / fire detector
- 1 wire from ELK m1 to observatory temp module
- 1 wire from ELK m1 to photoelectric sensor, plus 1 wire from sensor transmitter to sensor receiver
- 1 wire from ELK m1 to roof sensors
- 1 Cat 5 patch cord (wired as Ethernet 568B) from router to Ethernet adapter
- 1 wire from ELK m1 to incoming telephone block or DSL modem


m1OASYS
Architectural Diagram
All Rights Reserved - m1OASYS, LLC
Roof/Scope/Security Sensors
Scope Sensor Power
Roof Motor
Phone
DSL/ Modem
Router
M1XEP
PC
ASCOM
M1XSP
UPB Appliance Modules
Mount - Camera - PC
UPB Interface
Module
AC Service
Relay Output
Zones
Phone In
Comm Port
ELKm1Gold
Outputs
Out 2
12VAUX
Data Bus
Alarm Speaker
Battery
Backup
Data-Bus Hub
Keypad

Hints for installing m1 OASYS:

1. **For detailed installation instructions follow the ELK m1 Cross Platform Control installation manual and supporting documentation. Read the ELK M1 manual first!**

2. Installing the Base Unit
    - Following the directions Unpack and install the ELK m1 cabinet. The cabinet can be installed between wall studs or on a finished wall. When installing between wall studs be sure to leave plenty of room for the door to function properly.

3. Installing Data Bus Hub
    - Following the DBH directions, install DBH on the lower right area of the ELK cabinet
    - Use correct Cat 5 cabling scheme for all adapters and keypads (568A) - see Data Bus Hub wiring diagram

4. Installing Relay Board
    - Following the Relay Board directions, install the Relay Board in the upper left area of the ELK cabinet

5. Installing Keypad
    - Follow the ELK m1 direction. Use correct Cat 5 cabling scheme for all adapters and keypads (568A) - see Data Bus Hub wiring diagram

6. Installing M1XEP Ethernet Interface Adapter
    - Follow the M1XEP directions. Install near the ELK m1 Cabinet or near Internet Router
    - Use correct Cat 5 cabling scheme for all Ethernet Adapter (568B)
    - There are detailed directions in the Ethernet Adapter installation guide on setting IP static addresses and connecting to the net. Follow these directions closely, and be sure to configure your router as instructed. The router comes configured for a dynamic IP address and most will want to change this to a static address….see page 23.

7. Installing optional Serial/Lighting Control Interface
    - Follow Serial Control Interface directions and install near main observatory computer. You will need to program the UPB Power Modules using your computer and the UPBStart program before you connect the UPB Computer Interface to the Serial Control Interface.
    - Use correct Cat 5 cabling scheme for all adapters and keypads (568A) - see Data Bus Hub wiring diagram

8. Installing optional alarm features
    - If you are <u>not</u> installing the alarm speaker then you must install a 2200 ohm terminating resistor on output 2.

- Install Security Sensors onto Zones 1-6
- Install Fire and Smoke Alarm on Zone 16

9. Connecting m1OASYS to phone system
    - If you are a DSL customer then be sure to connect ELK M1 Control from the DSL modem and not direct to your phone block

10. Connecting your m1OASYS to a BYO LBB Roof Motor Interface
    - The roof open and close relays on the BYO LBB Interface share common.
    - Use N/O (normally open) position on the relay board
    - Must use Output 9 for Open and Output 10 for Close (

11. Installing Roof position sensors
    - See Diagram 1. Wire 2 plunge sensors into the black metal roof position sensor bracket. Mount the bracket on a side wall in such a way as to determine a full open and a full close position - assuming your roof rolls off to the North, this is typically a position near the Northern most wall of the observatory. With the roof in a full close position, mark the position just above the Northern most sensor on the bracket and install one of the Teflon pads on the roof stud (you may need to install stand off block to make this work). Do the same with the roof in a full open position. Mark a spot above the Southern most sensor on the bracket and install one of the Teflon pad on the roof stud.
    - Connect Roof Open Sensor to Zone 11
    - Connect Roof Close Sensor to Zone 12

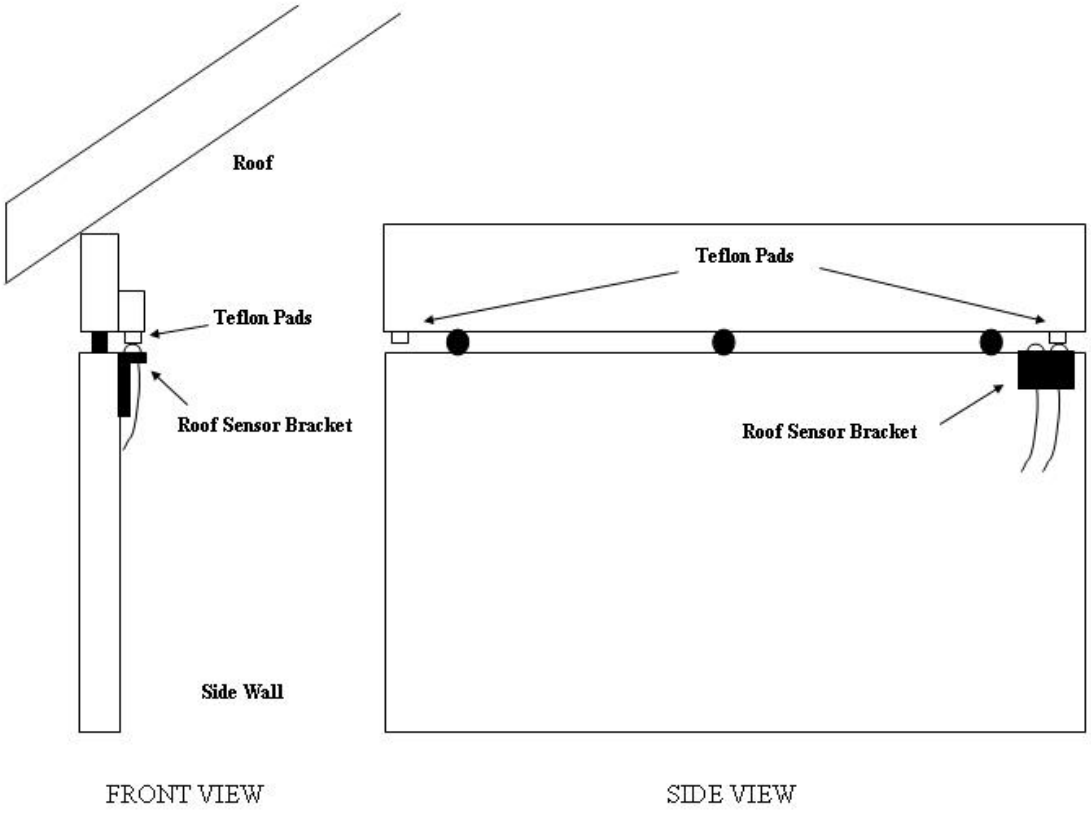

Roof
Teflon Pads
Roof Sensor Bracket
Side Wall
Teflon Pads
Roof Sensor Bracket
FRONT VIEW
SIDE VIEW

Diagram 1

12. Installing Scope Safety Sensors
    - Connect Scope 1 Sensor 1 to Zone 7
    - Optional - Connect Scope 1 Sensor 2 to Zone 8
    - Optional - Connect Scope 2 Sensor 1 to Zone 9
    - Optional - Connect Scope 2 Sensor 2 to Zone 10

13. Install Optional Observatory Temperature Probe
    - Connect Observatory Temperature Probe to Zone 14
    - Install in an location that does not get direct sunlight

14. Installing m1 OASYS Software
    - Install ELK RP Software from the Installation CD

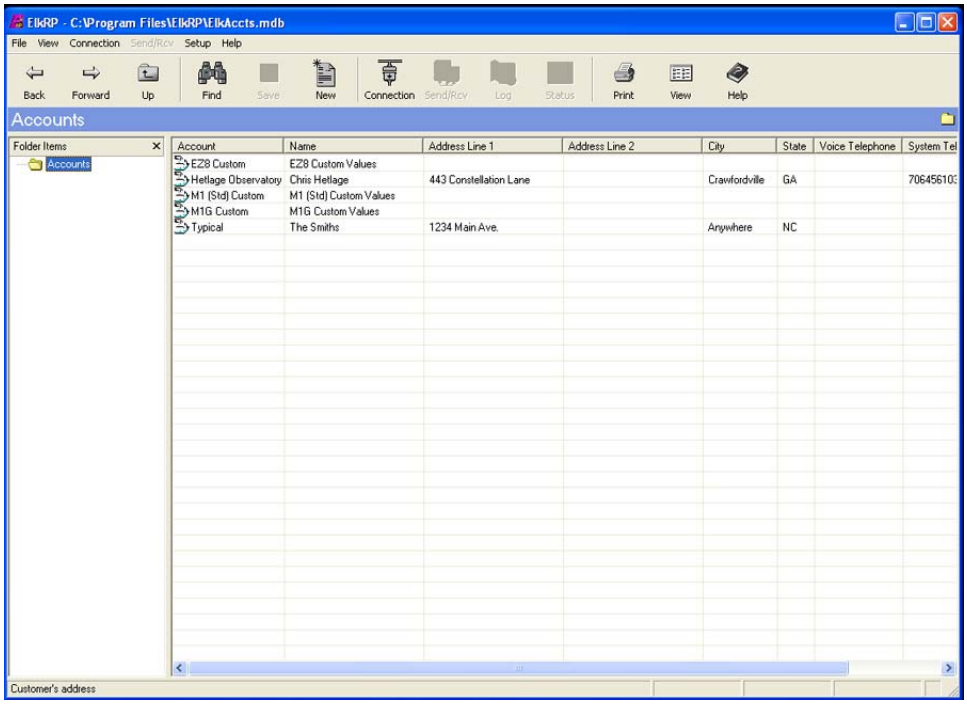
Installing the m1 OASYS Remote Programming Application

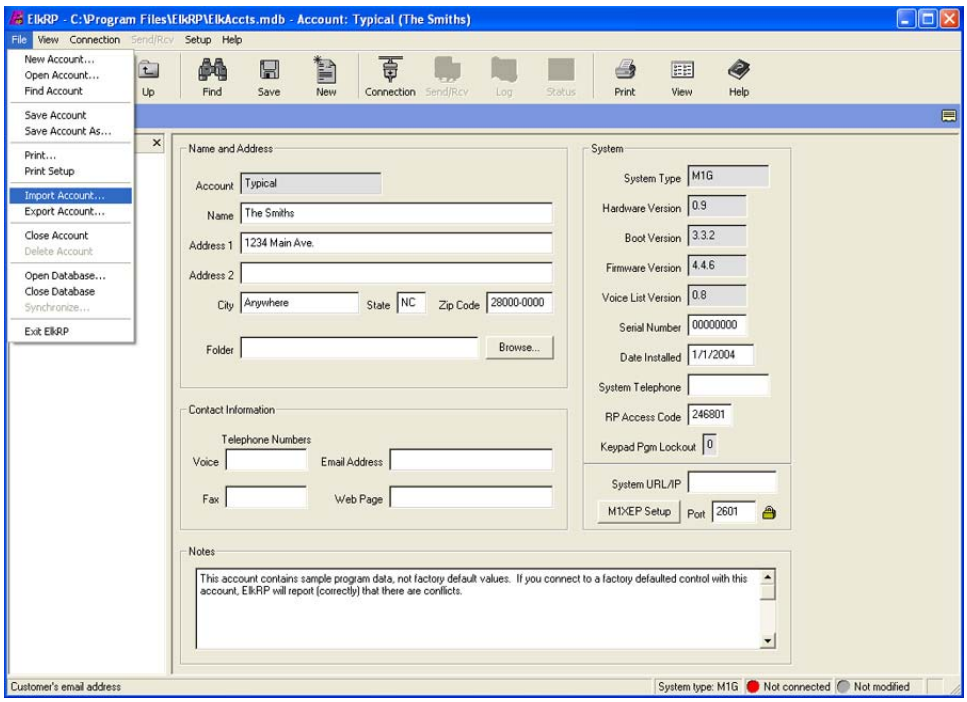
Once have successfully installed the ELK RP Software from the installation CD you will need to create an account for your observatory. The m1OASYS Live software has certain requirements that need to be included into your account file. To see the default settings for the m1 OASYS see Appendix A.

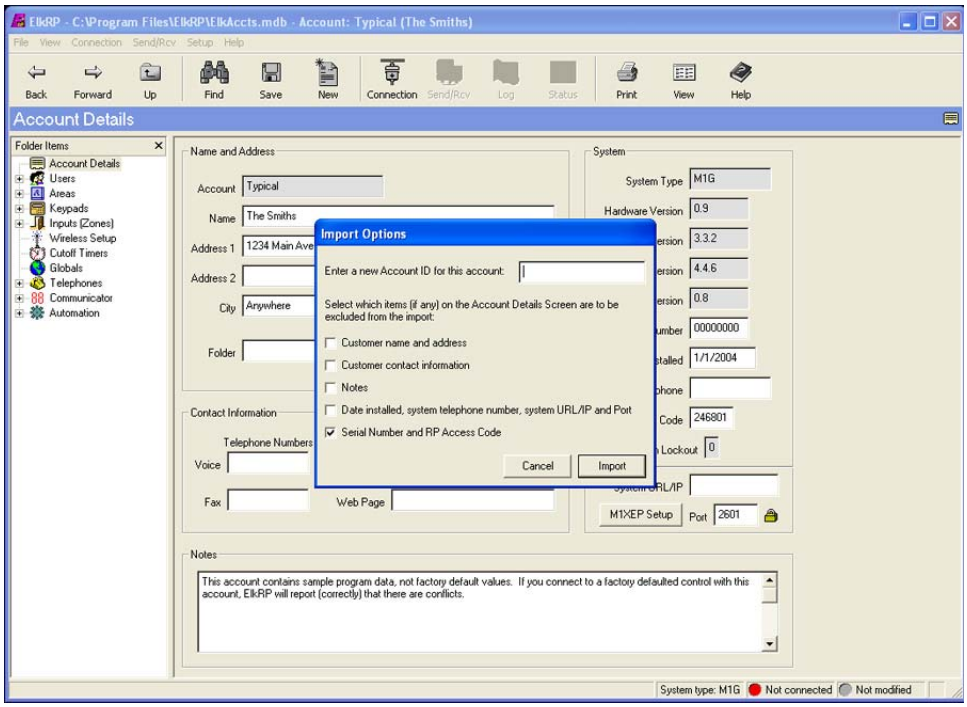
The first thing you will need to do is to create your own account in the RP software. At this point you have 2 choices. 1) You can create your own account and build your system from scratch using the default settings in Appendix A or 2) you can import the START Database included in your CD, m1OASYS_START_ElkRPAcct.exp. The RP software will not allow you to directly import the example setup file to an existing account so follow these directions if you want to start off with this file.

Installing the m1 START Database

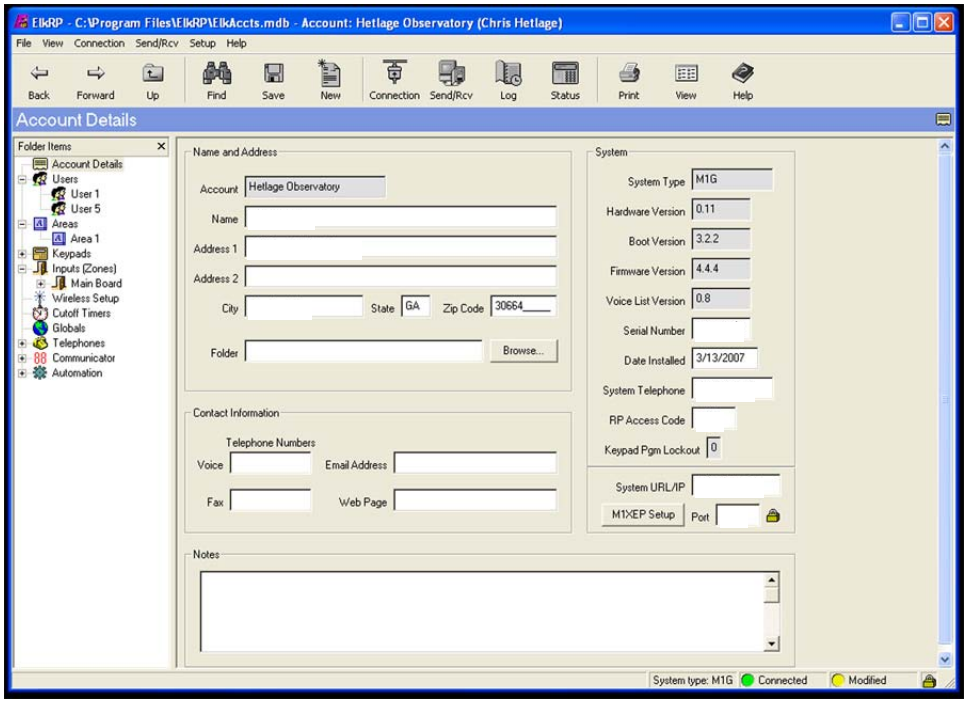
To create your account using the START Database you must first open the sample Account, The Smiths. Once opened you can import the START Database found on the installation CD.




ElkRP - C:\Program Files\ElkRP\ElkAccts.mdb - Account: Typical (The Smiths)
File View Connection Send/Rcv Setup Help
New Account...
Open Account...
Find Account
Save Account
Save Account As...
Print...
Print Setup
Import Account...
Export Account...
Close Account
Delete Account
Open Database...
Close Database
Synchronize...
Exit ElkRP
Up Find Save New Connection Send/Rcv Log Status Print View Help
Name and Address
Account Typical
Name The Smiths
Address 1 1234 Main Ave.
Address 2
City Anywhere State NC Zip Code 28000-0000
Folder Browse...
Contact Information
Telephone Numbers
Voice Email Address
Fax Web Page
System
System Type M1G
Hardware Version 0.9
Boot Version 3.3.2
Firmware Version 4.4.6
Voice List Version 0.8
Serial Number 00000000
Date Installed 1/1/2004
System Telephone
RP Access Code 246801
Keypad Pgm Lockout 0
System URL/IP
M1XEP Setup Port 2601
Notes
This account contains sample program data, not factory default values. If you connect to a factory defaulted control with this account, ElkRP will report (correctly) that there are conflicts.
Customer's email address
System type: M1G Not connected Not modified

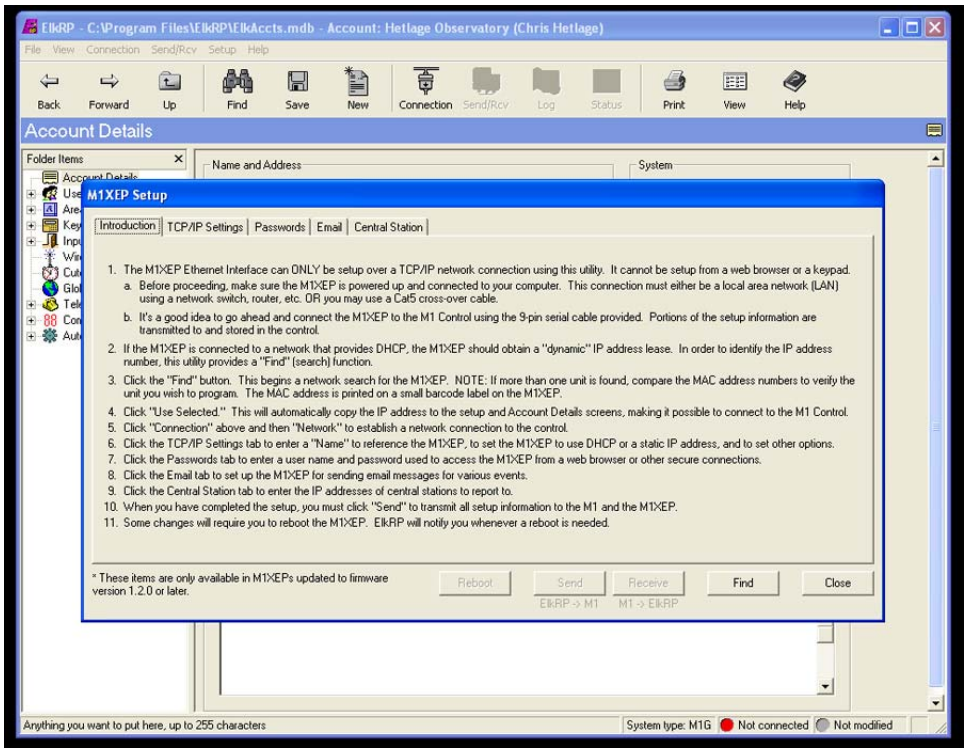

ElkRP - C:\Program Files\ElkRP\ElkAccts.mdb - Account: Typical (The Smiths)
Back Forward Up Find Save New Connection Send/Rcv Log Status Print View Help
Account Details
Folder Items
Account Details
Users
Areas
Keypads
Inputs (Zones)
Wireless Setup
Cutoff Timers
Globals
Telephones
Communicator
Automation
Import Options
Enter a new Account ID for this account:
Select which items (if any) on the Account Details Screen are to be excluded from the import:
Customer name and address
Customer contact information
Notes
Date installed, system telephone number, system URL/IP and Port
Serial Number and RP Access Code
Cancel Import
Name and Address
Account Typical
Name The Smiths
Address 1 1234 Main Ave
Address 2
City Anywhere
Folder
Contact Information
Telephone Numbers
Voice
Fax Web Page
System
System Type M1G
Hardware Version 0.9
3.3.2
4.4.6
0.8
00000000
1/1/2004
Code 246801
Lockout 0
M1XEP Setup Port 2601
Notes
This account contains sample program data, not factory default values. If you connect to a factory defaulted control with this account, ElkRP will report (correctly) that there are conflicts.
System type: M1G Not connected Not modified

Once you have your account created you can now enter your site specific information, including Access Code and Serial Number. Most of these fields are informational only and are not technically needed, with the exception of the Serial Number, Install Date, and RP Access Code. Do not enter the System URL/IP address at this time.

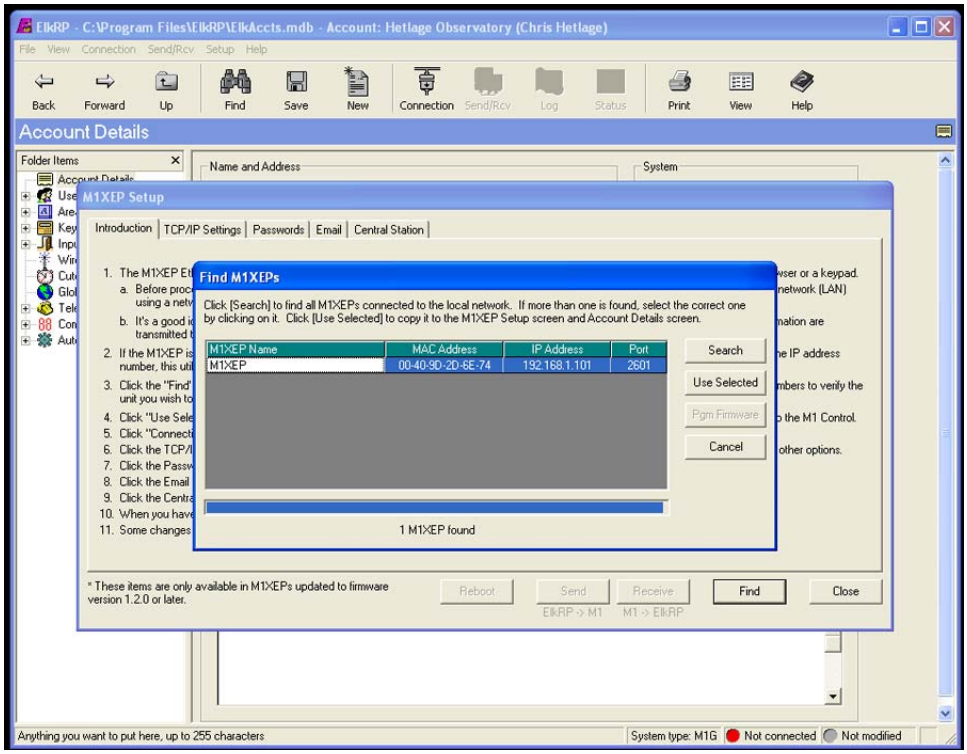


Connecting RP to Ethernet Adapter

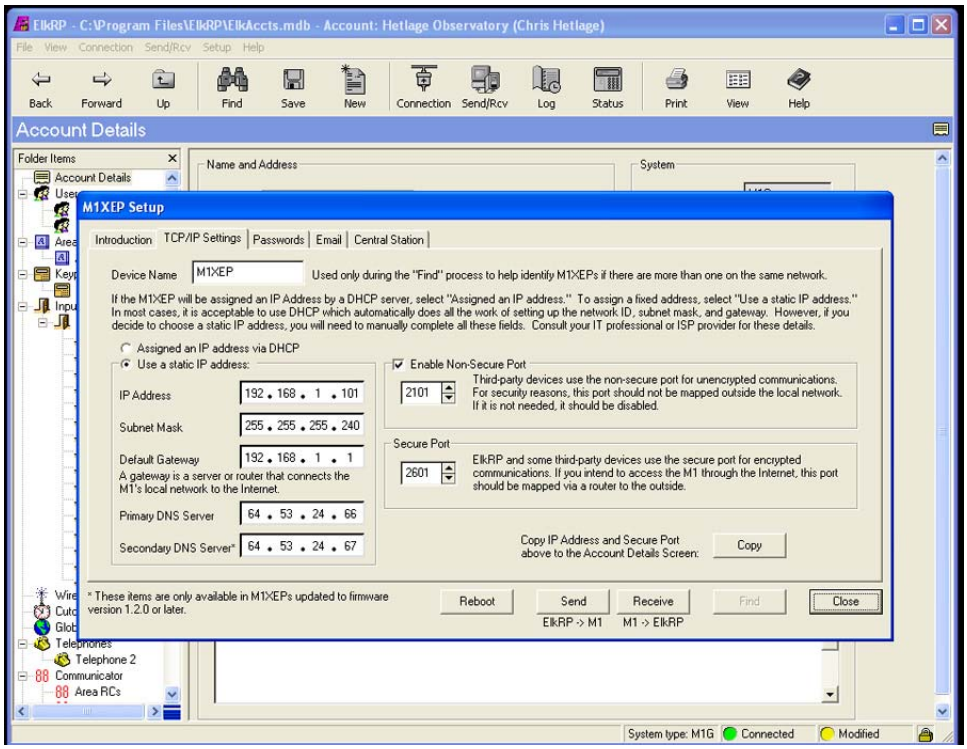
1. Click on M1XEP Setup.
2. Click on Find. The RP will search your LAN looking for the XEP



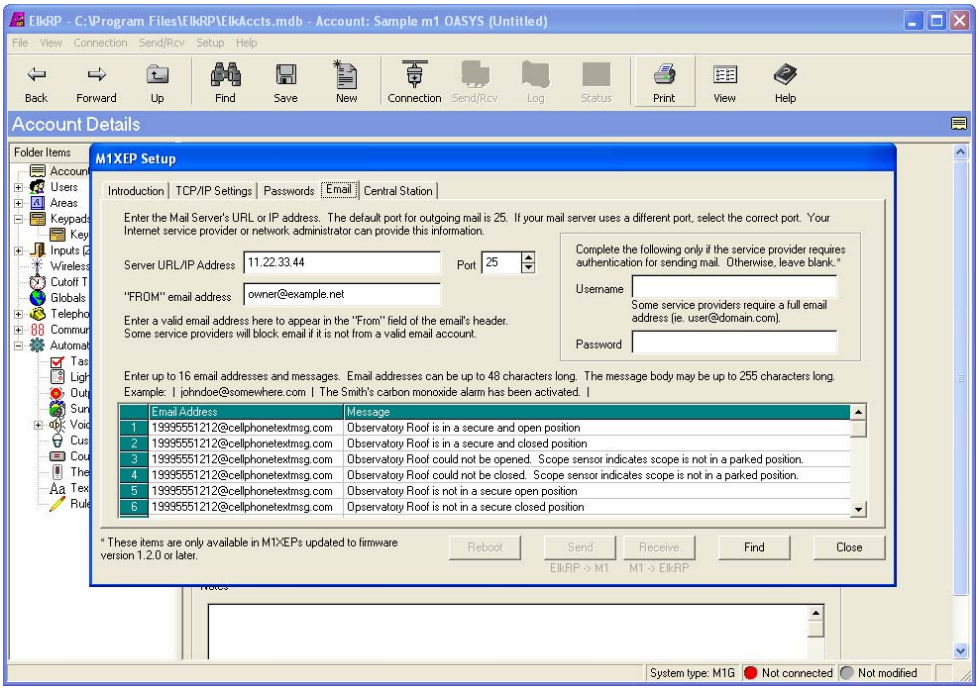
3. Once the RP software finishes its search you should see your XEP module listed as below. If you do not see the XEP then check your XEP installation and wiring.



4. You can now add your site specific IP information. Be sure to check Enable Non-Secure Port, this is to be used by the m1 Live SW Driver. The entries below are for example only. To gain access to your m1 from a remote location you will need to configure your Internet Router to forward the secure port to the m1's IP address. See the XEP manual for more information on setting up the XEP for remote access.

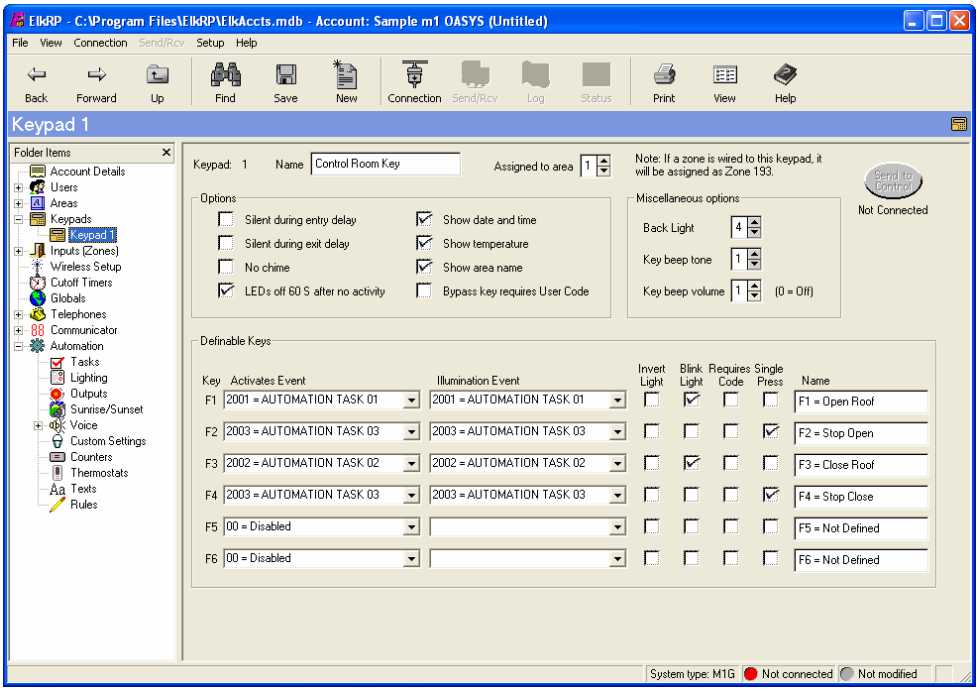


5. At some point you may want to configure text messages or email messages on the Email tab. Below are several examples of message that are sent from the m1 Automation Rules, see Appendix A for more examples. Hint: the m1 works best if you can use your mail servers IP address. Another suggestion, if you must use a URL as the mail server, is to be sure the DNS Servers on the previous screen match your routers settings from your ISP. If you are not using text messaging then you must remove all references to sending messages from the m1 rules.



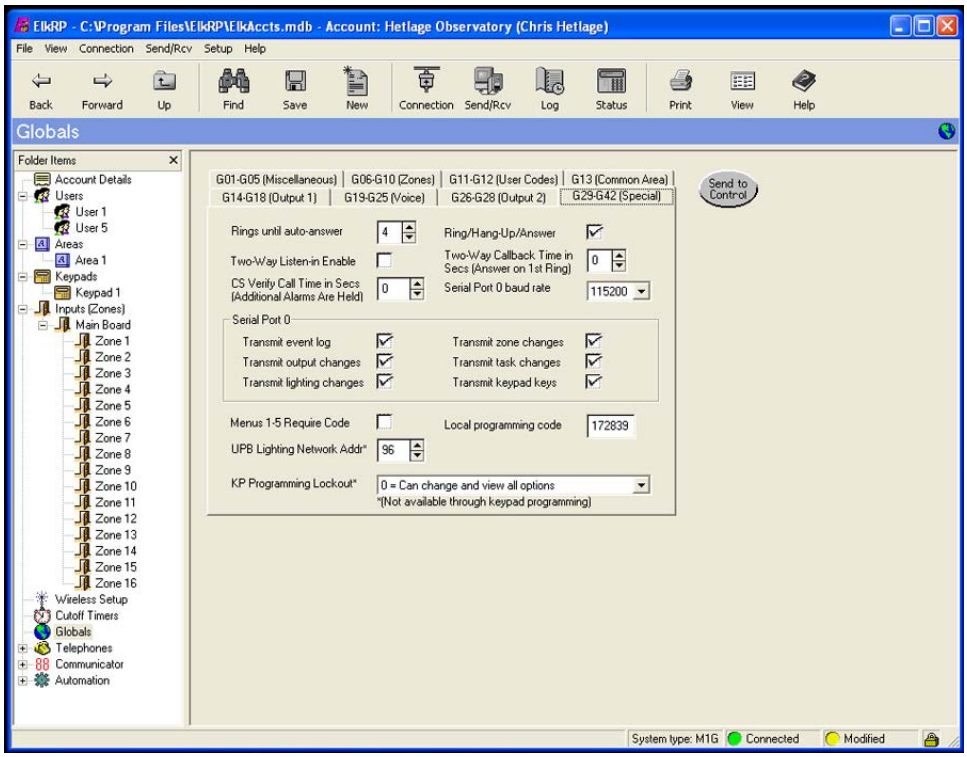
Keypad Settings

1. You can define your keypad name and settings from this screen. Once you have built your Automation Tasks you can configure the keypad to execute select tasks simply by pressing a key on your keypad. In this example you can press F1 on the keypad and this will trigger the Open Roof task.



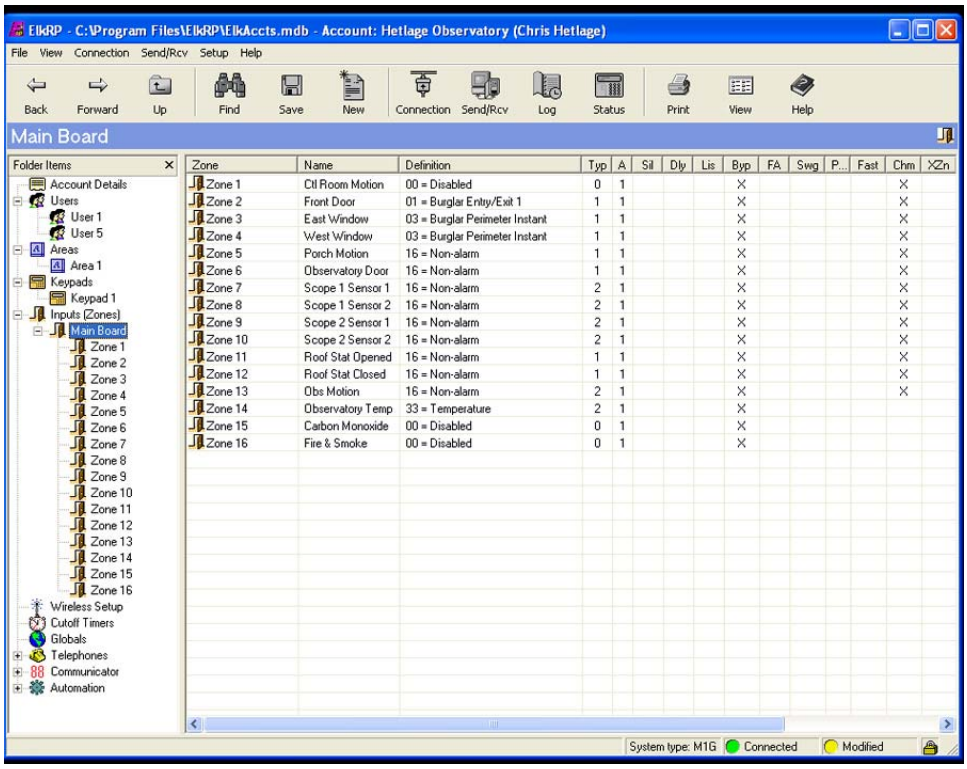
Global Settings

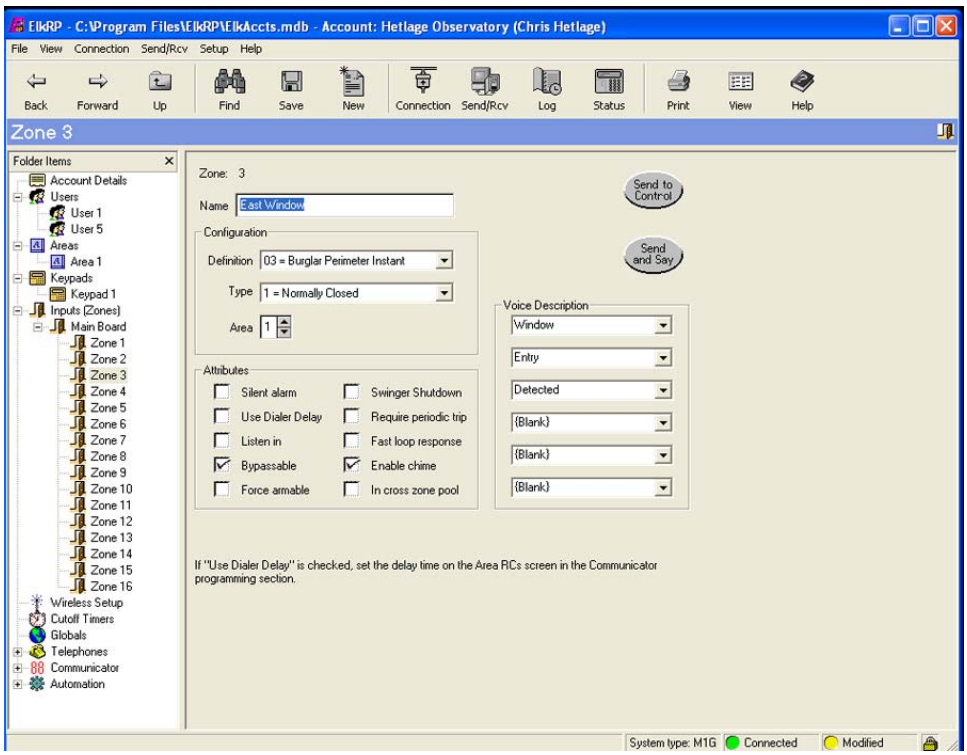
1. Be sure to have the Serial Port 0 defined as shown below, this is required for the m1 Live Software. Also note the UPB Lighting Network Address. If you have UPB devices you will need to change this once you have installed your UPB devices.

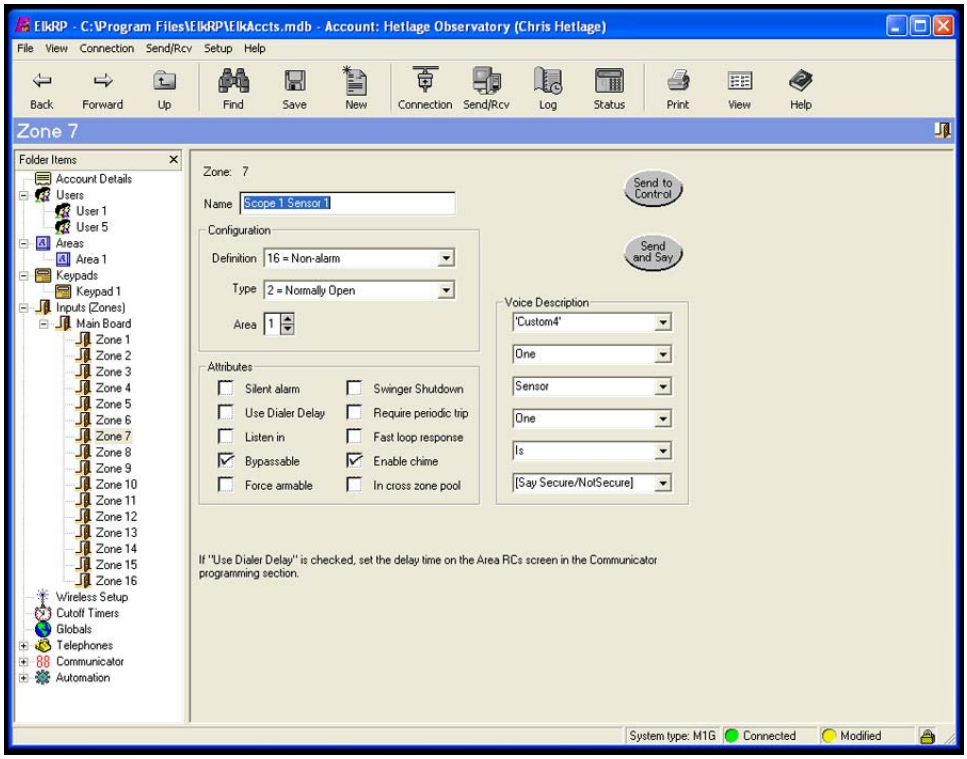


Input Zones

1. This is where you define all your sensors, smoke alarms, and temperature probes. A few hints…
    a. You must wire these as defined in the installation instructions above.
    b. All sensors are pre-configured to have a 2200 ohm resistor as a security feature, EOL Supervised. Resistors are provided, however if you decide not to use these you will need to manually set these as normally open or normally closed or disabled (otherwise your system will post bunches of errors.
    c. If a zone is not used simply set it to 00 - Disabled
    d. Window security sensors are typically configured as 03-Burglar Perimeter Instant. Front Door typically configured as 01-Burglar Entry/Exit. Scope/Roof Sensors are typically set to 16-Non-alarm. Temp Probe should be set to 33-Temperature

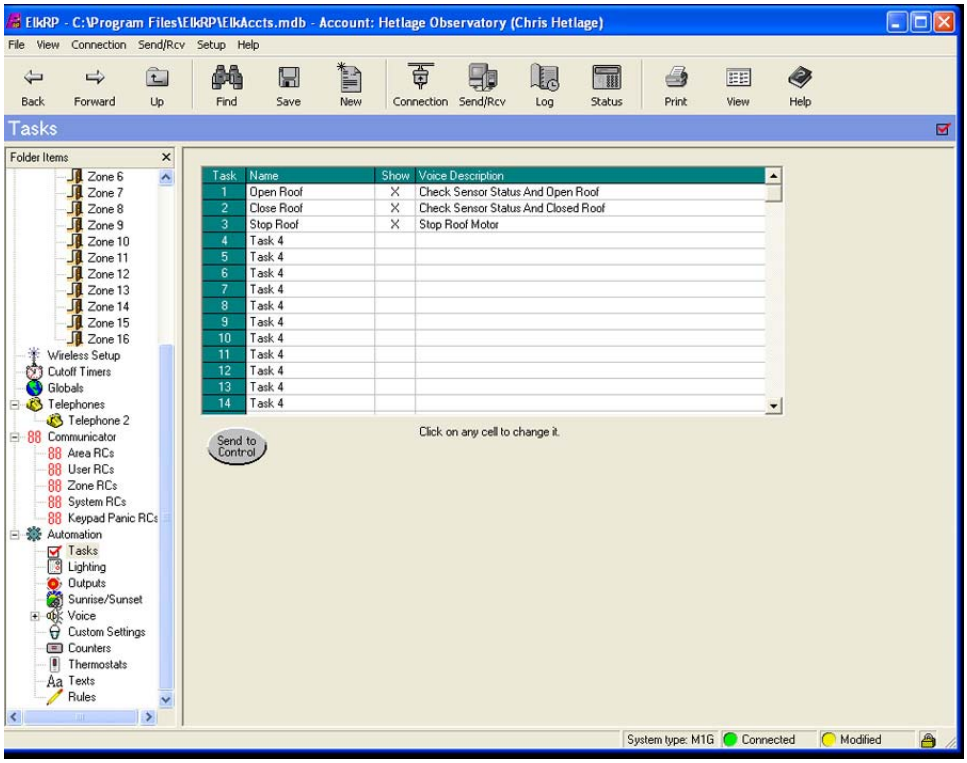



ElkRP - C:\Program Files\ElkRP\ElkAccts.mdb - Account: Hetlage Observatory (Chris Hetlage)
File View Connection Send/Rcv Setup Help
Back Forward Up Find Save New Connection Send/Rcv Log Status Print View Help
Zone 3
Folder Items
Account Details
Users
User 1
User 5
Areas
Area 1
Keypads
Keypad 1
Inputs (Zones)
Main Board
Zone 1
Zone 2
Zone 3
Zone 4
Zone 5
Zone 6
Zone 7
Zone 8
Zone 9
Zone 10
Zone 11
Zone 12
Zone 13
Zone 14
Zone 15
Zone 16
Wireless Setup
Cutoff Timers
Globals
Telephones
Communicator
Automation
Zone: 3
Name East Window
Send to Control
Send and Say
Configuration
Definition 03 = Burglar Perimeter Instant
Type 1 = Normally Closed
Area 1
Voice Description
Window
Entry
Detected
{Blank}
{Blank}
{Blank}
Attributes
Silent alarm
Swinger Shutdown
Use Dialer Delay
Require periodic trip
Listen in
Fast loop response
Bypassable
Enable chime
Force armable
In cross zone pool
If "Use Dialer Delay" is checked, set the delay time on the Area RCs screen in the Communicator programming section.
System type: M1G
Connected
Modified


ElkRP - C:\Program Files\ElkRP\ElkAccts.mdb - Account: Hetlage Observatory (Chris Hetlage)
File View Connection Send/Rcv Setup Help
Back Forward Up Find Save New Connection Send/Rcv Log Status Print View Help
Zone 7
Folder Items
Account Details
Users
User 1
User 5
Areas
Area 1
Keypads
Keypad 1
Inputs (Zones)
Main Board
Zone 1
Zone 2
Zone 3
Zone 4
Zone 5
Zone 6
Zone 7
Zone 8
Zone 9
Zone 10
Zone 11
Zone 12
Zone 13
Zone 14
Zone 15
Zone 16
Wireless Setup
Cutoff Timers
Globals
Telephones
Communicator
Automation
Zone: 7
Name Scope 1 Sensor 1
Send to Control
Send and Say
Configuration
Definition 16 = Non-alarm
Type 2 = Normally Open
Area 1
Voice Description
'Custom4'
One
Sensor
One
Is
[Say Secure/NotSecure]
Attributes
Silent alarm
Swinger Shutdown
Use Dialer Delay
Require periodic trip
Listen in
Fast loop response
Bypassable
Enable chime
Force armable
In cross zone pool
If "Use Dialer Delay" is checked, set the delay time on the Area RCs screen in the Communicator programming section.
System type: M1G
Connected
Modified

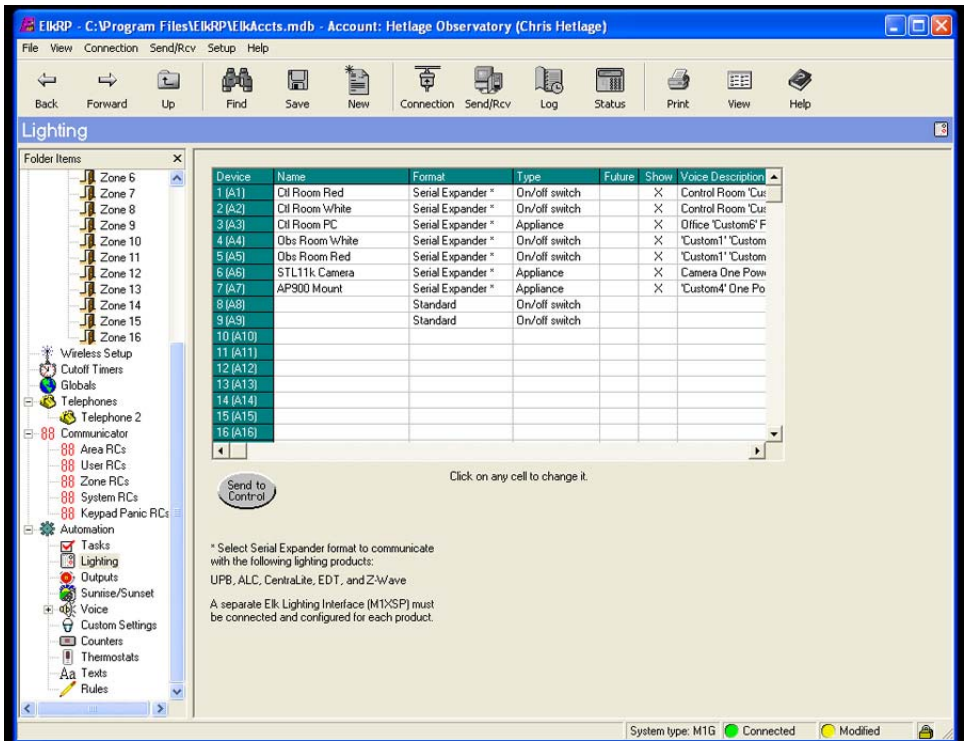
Automation Tasks

- At a minimum the following tasks must be defined, in order, for the m1 Live application



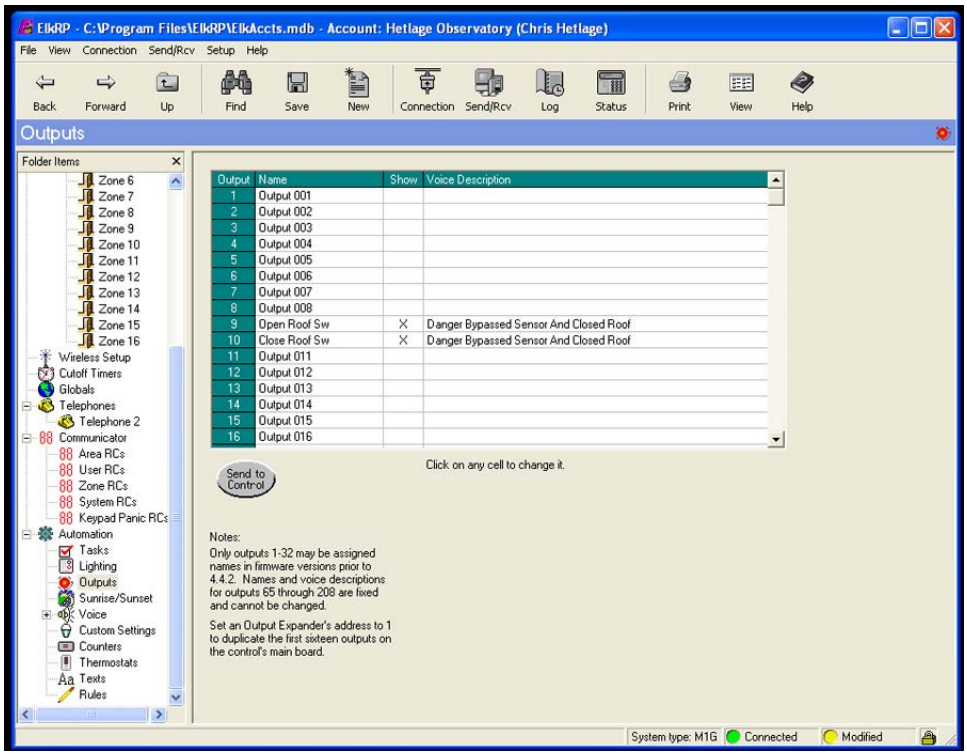
Lighting – optional

- Define modules as Appliances (i.e. no dimmer) and Light Switches as On/off switch. Before controlling these devices you must first install and run the Simply Automated UPB Start Application and follow the directions to address each device, as well as setting the UPB Network Address in the Global Settings above. See the Lighting/Serial Port Expander installation instructions for more information



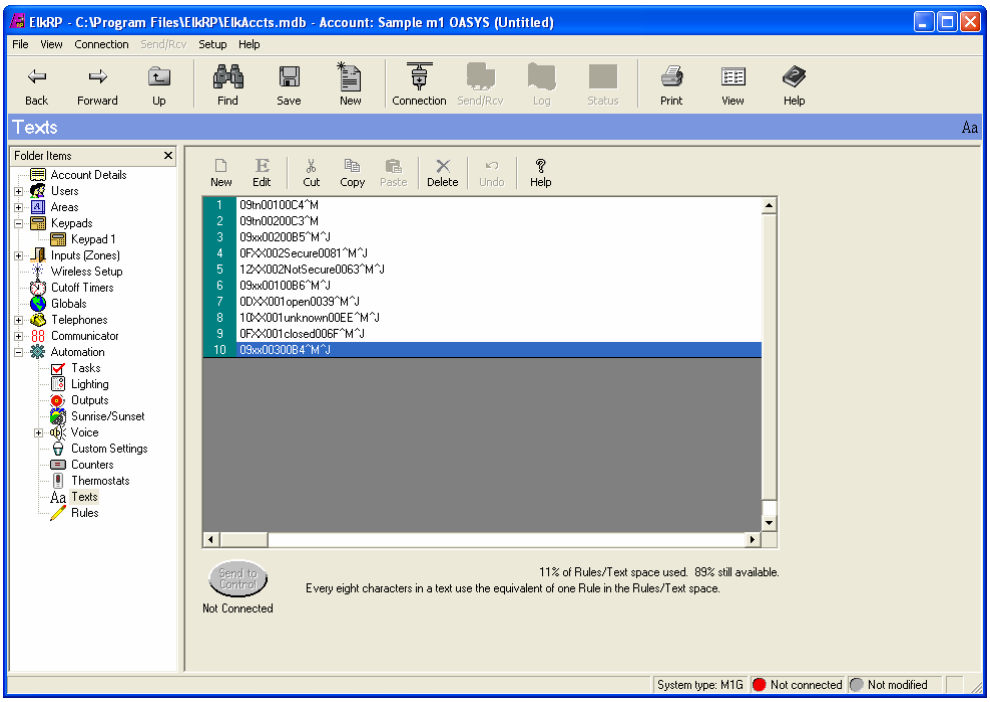
Outputs

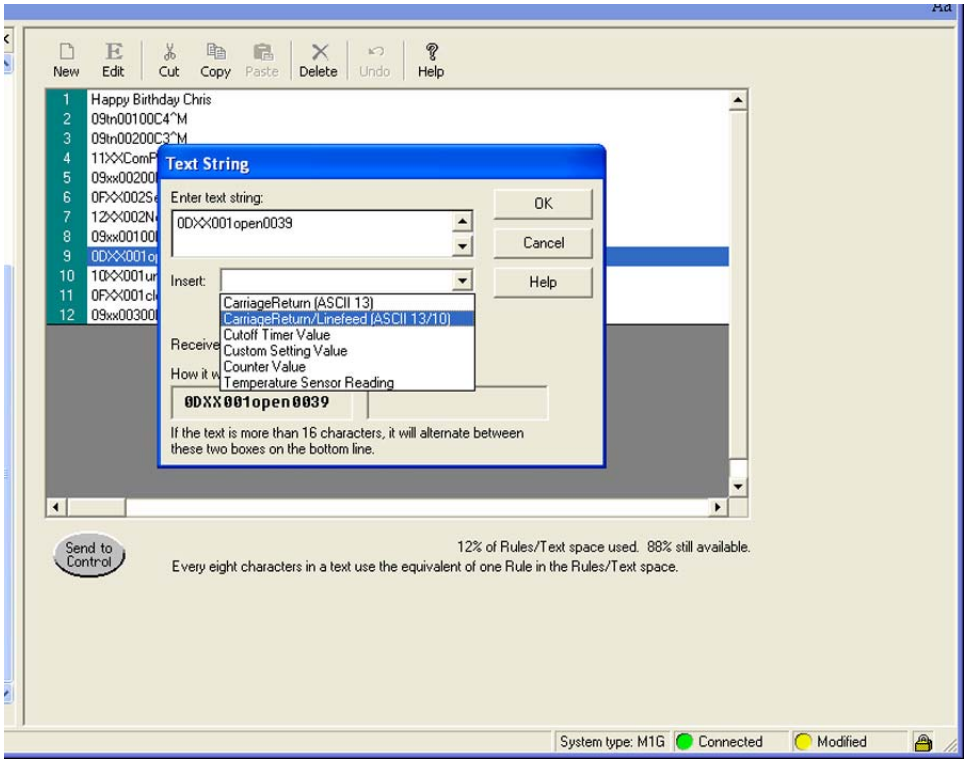
- Define the relay board outputs as below:



Text – ASCII definitions for m1 Live

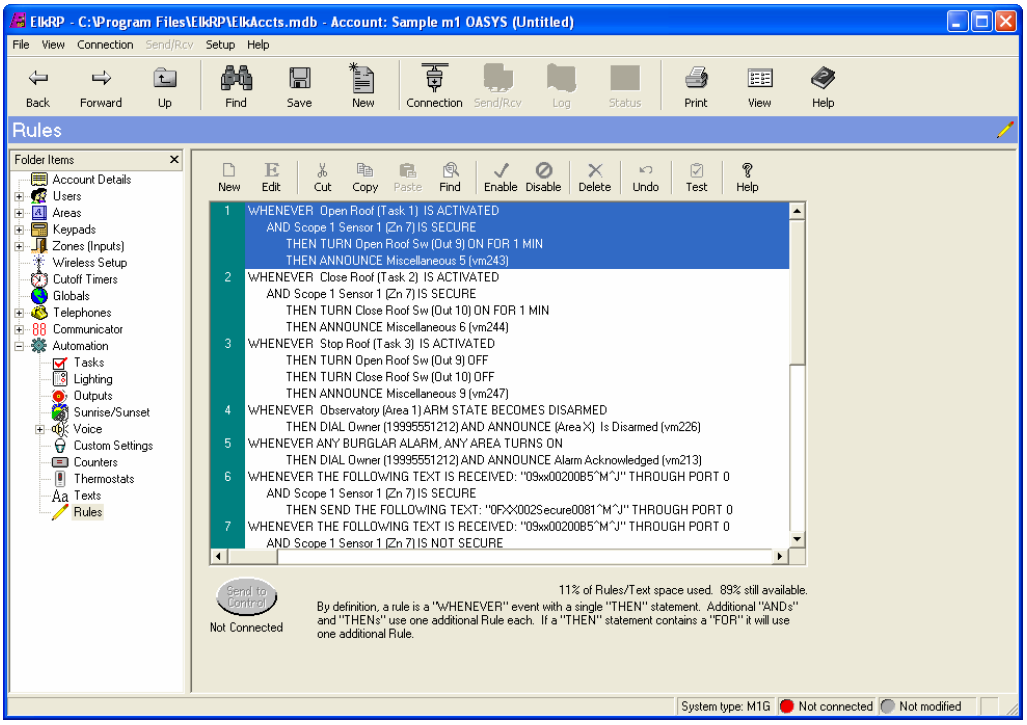
The following text items must be defined, in order, for the m1 Live application to properly function. A carriage return and line feed must follow each entry…see details. Note that if you delete a row that will effect the rules that monitor these so be careful when adding and deleting these messages.





Version 1.x M1 Live Messages

1 - 09tn00100C4^M - Executes Open Roof Task
2 - 09tn00200C3^M - Executes Close Roof Task
3 - 09xx00200B5^M^J - Scope Sensor Status Request
4 - 0FXX002Secure0081^M^J - Response to Scope Status Request
5 - 12XX002NotSecure0063^M^J - Response to Scope Status Request
6 - 09xx00100B6^M^J - Roof Sensor Status Request
7 - 0DXX001open0039^M^J - Response to Roof Sensor Status Request
8 - 10XX001unknown00EE^M^J - Response to Roof Sensor Status Request
9 - 0FXX001closed006F^M^J - Response to Roof Sensor Status Request
10 - 09xx00300B4^M^J - Send email to User on External Application Roof Control Requests

IX. Automation Rules

Read the ELK M1 Cross Platform Control instructions for detail on writing rules. At a minimum the rules defined in Appendix A should be implemented for the m1Live application to properly function. You will also need to adjust the timing of your roof open/close and add this to the Open/Close Roof rules below, add a few seconds to your actual timing if you have limit switches on your roof motor. **You MUST test these thoroughly on your own installation to ensure they are working as you want them to.**